machine, is applied to the bottom edge of the box. At a touch on the foot treadle the box revolves, drawing the strip into place as guided and pressed by the operator. An automatic cut-off cuts the strip at the required length. The box is now removed from the block and set on a table where an assistant bends the strip over on to the bottom and rubs it down. The covering machines used for box stripping are driven from line shafting through ½" round belts to 8" pulleys. Their speed is about 400 R. P. M. The cover strippers are of a smaller size than the box strippers and require only ⅜" round belts to turn their 8" pulleys at 400 R. P. M. They are driven by individual ⅓ H. P. electric motors.

All of the box staying and stripping machines are driven through 2" line shafting by a 5 H. P. electric motor.

Routing

The sequence of operations described in the preceding section is illustrated graphically in the "Routing Map" (Figure 4). In this map, each circle represents a facility and each straight line the course of work to and from these facilities. The figures on the lines show the average number of pieces (boxes or covers) or the number of pairs of ends which pass over each course in an hour.

Turning to the map, we observe that the newsboard is brought up the elevator from the basement storage and is distributed to either a double scorer or the guillotine. After being scored, the blanks are delivered to a corner cutter or the mitering machine. It will be observed that only 2,140 box forms are delivered to the mitering machine, whereas a total of 4,610 forms are corner cut. This shows us that about 1,240 boxes per hour are corner cut and made in the same manner as the covers. The corner-cut blanks and the few mitered blanks which are to be used on the single enders are passed through one of the two benders and are delivered to a stock bin. The blanks for the double enders are delivered either to a stock bin or direct to the machine. Ends cut on the guillotine knife are kept in stock until needed. From the ending machines the boxes pass to one of the five groups of box staying and stripping machines. The 1,200 odd corner cut boxes come from the stock bin where they have been holding and also pass through the five box machines. The 3,300 odd boxes are then fitted with the corresponding number of covers. Some are delivered loose to the ordering department and some are bundled before delivery.

Floor Layout

The floor plan in Figure 5 shows how the routing map has been used to advantage in laying out the machines in the department. The fundamental idea is to have the machines in the order in which the work is to progress. They should be placed near together to minimize handling of material but far enough apart to avoid crowding. Machines upon which close work is to be done should be placed near the windows, and machines receiving their power through overhead shafting should be grouped in order to keep this expense low. The layout adopted fulfills all of these requirements reasonably well.

The machines are so arranged that the raw board, started near one end of the room, goes through the successive operations and emerges at the other end in the form of finished boxes. The double scorers which perform the first operation sometimes require very close work and are therefore placed near the windows. From the scorers the blanks progress through the miterer, corner cutters, and benders shown in Figure 6 to the center aisle across which they are located in the stock bins. The bending machines (Figure 7) are located between the cutting machinery and the box-staying and stripping machines so that the ended boxes will be deposited within easy carrying distance of the latter. Staying and stripping machines are set on the bias as shown on account of the light and so that the boxes or covers may be started from the outside of the room and flow directly towards the center. The battery of cover-making machines illustrated in Figure 8, is placed on one side of the room and the box machines on the other, so that the boxes and covers come from either side of the center, are here united in the assembly space and delivered via the center aisle to the customer department. Figure 9 is a view of the box stripping machines.

Production Control

A box department by nature of its product is required to give service to the other producing departments. It is essential that the boxes be delivered within a few hours of the time when they are wanted; no later, because production must not be delayed; no sooner, because boxes are bulky and little floor space is available for their storage. Planning must, therefore, be very close and consequently a great deal of it devolves upon the foreman.

In August of each year the foreman receives from each department an estimate of the number of boxes it will require during the next year. From these esti-

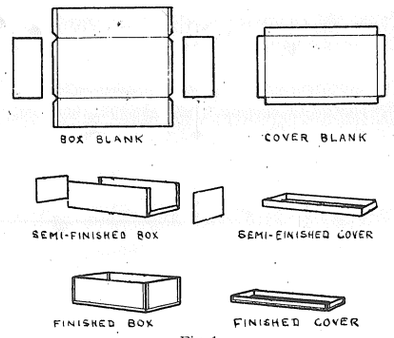

Fig. 1

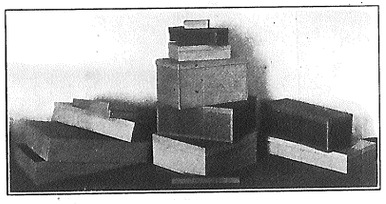

Fig. 2

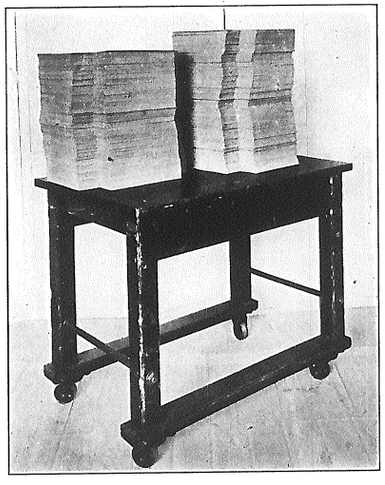

Fig. 3

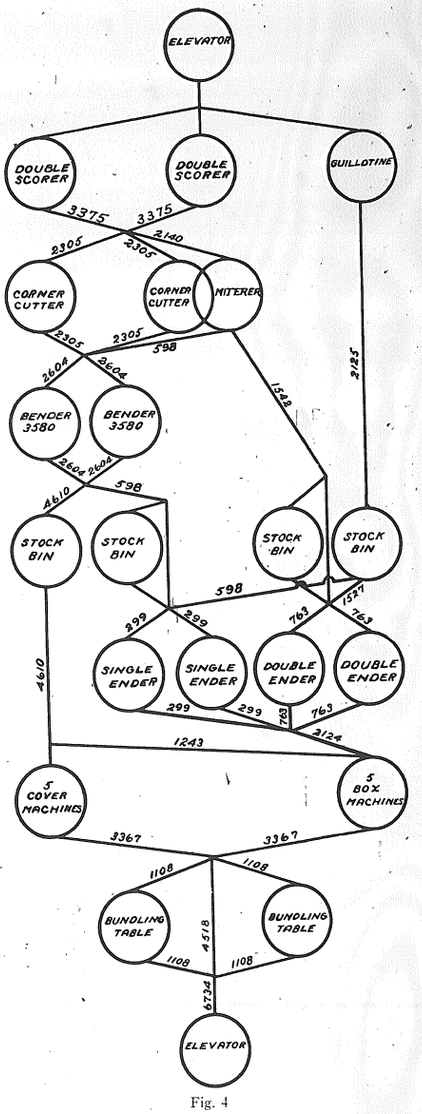

Fig. 4